

Do-It-Yourself Home Energy Assessment

❖ Part I. Getting Ready

Before you begin your do-it-yourself home energy assessment, create or print off a checklist of areas you want to inspect (see a sample checklist below). You should also keep track of the areas of your home that need improvement, either by writing down what you've found, or by using colored tape to indicate what rooms and features need energy efficient upgrades.

Here are some tools and materials you'll need before you begin:

- Dusk mask, eye protection and gloves
- Pen or pencil and your checklist (below)
- Calculator and tape measure
- Screwdrivers
- Incense stick or candle
- Flashlight
- Ladder
- Painters tape to mark problem areas

You may also want to consider making some of the easier fixes on the day of your home energy assessment. If you're planning to do so, you may want to pick up some low cost materials to address common problems. Suggested materials include:

- Caulk
- Weather Stripping
- Insulation
- Plastic sheeting for windows
- Compact Fluorescent Light bulbs
- Duct sealant (mastic)

❖ Part II. Detecting Air Leaks

Air leaks around doors, windows and other areas can cause up significant energy loss and make your home less comfortable. Try one or all of the ideas below to detect air leaks. You may also want to consider hiring a professional to help you identify and fix other sources of air loss in your home.

1. Visually inspect areas around your home that are most likely to have cracks or gaps which could cause air leaks. Use our checklist for guidance.
2. Depressurize your home and conduct a "smoke test." This test works best on a day that is cool and windy.
 - a. Turn off your furnace.
 - b. Shut all windows and doors.
 - c. Turn on all of your exhaust fans, such as those in the kitchen or bathroom, that blow air outside

A Few Notes on Safety

As you conduct your home energy assessment and begin making improvements to your home, you may come across ducts or pipes that look as if they are insulated with asbestos. If you suspect your home contains asbestos, do not touch it. Call a professional who can assess the situation and remove the asbestos safely.

When sealing air leaks in your home, be aware of the danger of indoor air pollution and backdrafts, which occur when combustion appliances and exhaust fans compete for air. Though air pollution and backdrafts are unlikely, especially in older homes, consult a professional if you're uncertain. In general, understand your knowledge level and your limitations. If you see something that looks concerning, consult a professional.

- d. Once your home is depressurized, light an incense stick and pass it around doorways, window frames and other areas of common leak sites (see above). If smoke is sucked out of a room or blown into the room, it means you have a draft.
3. Close your doors, windows and refrigerators on a plain sheet of paper. If you can pull the paper out without it tearing, it means you have an air leak.
4. At night, walk around the inside of your house and shine a flashlight on areas prone to air leaks like windows, doors, foundations and vents. Have a partner stand outside to observe. If there are large cracks or gaps, your partner will see a ray of light. Unfortunately this test does not work well on small cracks, but can be a helpful start for finding or ruling out larger issues to repair first.

❖ Part III. Checking Insulation Levels

Insulation helps keep the energy you purchase inside of your house where it belongs. By checking to ensure insulation in your home meets recommended levels and installing additional insulation where needed, you can save a large amount of energy.

To check insulation levels in your **attic**:

- Check to see if that the attic hatch is weatherstripped and closes tightly
- Determine if openings for pipe, ductwork and chimneys are sealed
- Look for a vapor barrier under the attic insulation (usually made of tarpaper, Kraft paper attached to fiberglass batts, or a plastic sheet). The vapor barrier prevents water vapor from reducing the effectiveness of the insulation.
- Inspect attic vents to make sure they are not covered by insulation. Check the insulation level on your attic floor. If you can easily see your joists, you should add more insulation. If your attic insulation covers your joists and is distributed evenly, you probably have enough insulation.

To check insulation levels in your **walls**:

- Turn off the circuit breaker or unscrew the fuse for any outlets in the wall.
- Use a lamp or radio to test to make sure certain outlets are not “hot.” Please follow all safety precautions found at the Department of Energy (http://www.energysavers.gov/your_home/energy_audits/index.cfm/mytopic=11170)
- Remove the cover plate from one of the outlets.
- Using a thin, long stick (i.e. a chopstick or plastic knitting needle), gently probe into the wall. If you encounter slight resistance, you have insulation there.

Note that this method cannot tell you if the entire wall is insulated, or if the insulation has settled. You may want to hire a professional to conduct a thermographic inspection.

❖ Part IV. Inspecting Heating and Cooling Equipment

Most heating and cooling equipment should be inspected at least once per year, or as recommended by the manufacturer. While inspecting your equipment, you should look at the ductwork to make sure there aren't any dirty streaks, which indicate air leaks.

You should also make sure that your water heater tank isn't emitting heat. Here's a quick test to tell if your water heater tank is well-insulated: touch it! If the tank is warm to the touch, it could use additional insulation.

Sample Checklist

Location	What To Look For	How To Fix	Status
Attic	Insufficient insulation; holes in the ceiling and floor; weatherstripping around hatch	Install additional insulation; Use spray foam and caulk for holes	
Basement and crawl spaces	Insufficient insulation; gaps in flooring	Install additional insulation; Use spray foam and caulk for holes	
Exterior walls	Insufficient insulation	Install additional insulation; Use spray foam and caulk for holes	
Electrical outlets and switch plates	Cracks; air leakage	Install foam or rubber gaskets	
Overhead lighting and Lamps	Inefficient light bulbs; air leakage (esp. for recessed lights)	Replace bulbs with CFLs; replace recessed lights with Air Loc models	
Wiring	Air leaks; cracks in walls	Seal gaps with spray foam	
Windows/Frames	Air leaks and drafts	Weatherstripping; caulk; storm windows; install energy-efficient window	
Baseboards	Cracks or holes	Caulk	
Doors	Cracks or holes	Weatherstripping; install or replace door threshold and sweep	
Fireplace	Check flue; cracks and holes	Close flue; install fire-rated sealant	
Air Conditioner units	Old or dirty air filters; cracks and air leaks	Replace or clean filter; Caulking; duct mastic	
Air registers	Dirty registers; disconnected ducts; air leaks	Clean air registers; replace duct work; reattach duct connections	
Plumbing, Pipes	Cracks or holes around plumbing	Seal gaps with spray foam	
Foundation	Cracks or holes	Install insulation; cement patches	
Siding	Cracks or other gaps	Caulk; install insulation	
Mail slots	Cracks	Caulk	
Refrigerator	Gaskets and seals	Replace gasket and seals; consider newer model	
Water Heater and Piping	Insufficient insulation	Install insulation jacket and sleeves	
Water Heater Thermostat	Set over than 125 degrees	Set to 120 degrees or lower	
Electronics, small appliances	Plugged in all of the time	Install power strip and turn off when not in use	
Walls	Insufficient insulation	Install insulation	
Floors	Insufficient insulation	Install insulation	
Exhaust fans	Large gaps where fan meetings wall	Seal gaps with spray foam	